

### **Amendments to Claims**

This listing of Claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims:**

**Claim 1.** (previously presented) An isolated nucleic acid encoding a polypeptide with isoflavone synthase activity having the amino acid sequence set forth in SEQ ID NO:66.

**Claim 2-10** (canceled).

**Claim 11.** (previously presented) A chimeric polynucleotide comprising the nucleic acid of Claim 1 operably linked to at least one regulatory sequence.

**Claim 12.** (previously presented) A transformed host cell comprising the chimeric polynucleotide of Claim 11.

**Claim 13.** (previously presented) The transformed host cell of Claim 12 further comprising a second chimeric polynucleotide comprising a nucleic acid encoding a polypeptide that regulates expression of at least one enzyme of the phenylpropanoid pathway.

**Claim 14.** (previously presented) The transformed host cell of Claim 13 wherein the second chimeric polynucleotide encodes a polypeptide comprising the maize C1 DNA binding domain, the maize transcription factor R, and the maize C1 activation domain.

**Claim 15.** (original) The transformed host cell of Claim 12 wherein the host cell is a eukaryotic cell.

**Claim 16.** (currently amended) The eukaryotic cell of Claim 15[[13]] wherein the cell is a yeast cell.

**Claim 17.** (original) The eukaryotic cell of Claim 15 wherein the cell is a plant cell.

**Claim 18.** (original) The plant cell of Claim 17 wherein the cell is a soybean cell.

**Claim 19.** (original) The plant cell of Claim 17 wherein the cell is a corn cell.

**Claims 20-25.** (canceled).

**Claim 26.** (previously presented) A method of altering the level of expression of isoflavone synthase in a host cell comprising:

(a) transforming a host cell with the chimeric polynucleotide of Claim 11 or transforming the host cell with the chimeric polynucleotide of Claim 11 and with a

second chimeric polynucleotide comprising a nucleic acid sequence encoding a polypeptide that regulates expression of at least one enzyme of the phenylpropanoid pathway; and

(be) growing the transformed host cell produced in step (a) under conditions that are suitable for expression of the chimeric polynucleotide wherein expression of the chimeric polynucleotide results in production of altered levels of isoflavone synthase in the transformed host cell.

**Claims 27 and 28** (canceled).

**Claim 29.** (previously presented) The method of Claim 26 wherein the host cell is a eukaryotic cell.

**Claim 30.** (currently amended) The method of Claim 29[[26]] wherein the eukaryotic cell is a yeast cell.

**Claim 31.** (currently amended) The method of Claim 29[[26]] wherein the eukaryotic cell is a plant cell.

**Claim 32.** (original) The method of Claim 31 wherein the plant cell is a soybean cell.

**Claim 33.** (original) The method of Claim 31 wherein the plant cell is a corn cell.

**Claims 34-50** (canceled).

**Claim 51.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Phe

Xaa<sub>16</sub> is Leu

Xaa<sub>23</sub> is Ser

Xaa<sub>25</sub> is Lys

Xaa<sub>39</sub> is Lys

Xaa<sub>48</sub> is Leu

Xaa<sub>60</sub> is Leu

Xaa<sub>73</sub> is Leu

Xaa<sub>74</sub> is Ser

Xaa<sub>95</sub> is Thr

Xaa<sub>96</sub> is His

Xaa<sub>102</sub> is Asn

Xaa<sub>110</sub> is Ile

Xaa<sub>112</sub> is Arg

Xaa<sub>117</sub> is Asn

Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Ser  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Val  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is Tyr  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Ala  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Glu~~  
~~Xaa<sub>293</sub> is Gln~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Arg  
Xaa<sub>328</sub> is Gln

Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Val  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Gly  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Asp.

**Claim 52.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Ser  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Ser  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Thr

Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Asn  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Arg  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Ser  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Val  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is Tyr  
Xaa<sub>253</sub> is Gly  
Xaa<sub>259</sub> is Glu  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Ala  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Glu~~  
~~Xaa<sub>293</sub> is Gln~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Leu  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala

Xaa<sub>325</sub> is Arg  
Xaa<sub>328</sub> is Gln  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Val  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Gly  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Asp.

**Claim 53.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His

Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Leu  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Tyr  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Thr  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Ile

Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Gly  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 54.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Pro  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr



Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Ser  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Val  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is Tyr  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Ala  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Glu~~  
~~Xaa<sub>293</sub> is Gln~~  
Xaa<sub>294</sub> is Ile

Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Arg  
Xaa<sub>328</sub> is Gln  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Ile  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is His  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Val  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Gly  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Asp.

**Claim 55.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu

Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Val  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~

~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Cys  
Xaa<sub>387</sub> is Thr  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Leu  
Xaa<sub>435</sub> is Arg  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 56.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Leu  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys

Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe

Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Ala  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 57.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Leu  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr

Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Ala  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val

Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 58.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Leu



Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys

Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Thr  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 59.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Leu  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His

Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Glu  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn

Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 60.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Leu  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Ile  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe

Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Asp  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Thr  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln

Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met  
Xaa<sub>485</sub> is Gly.

**Claim 61.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Leu  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile

Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Thr  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg



Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 62.** (currently amended) The isolated nucleic acid of Claim 1 where

Xaa<sub>10</sub> is Phe  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Ser  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Ser  
Xaa<sub>95</sub> is Ala  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Ser  
Xaa<sub>110</sub> is Val  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Asn  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Glu  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Ser  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Val

Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is Tyr  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Ala  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Glu~~  
~~Xaa<sub>293</sub> is Gln~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Arg  
Xaa<sub>328</sub> is Gln  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Val  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Lys  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe

Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Gly  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Asp.

**Claim 63.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>40</sub> is Phe or Leu~~

Xaa<sub>16</sub> is Ser  
Xaa<sub>23</sub> is Ser  
Xaa<sub>25</sub> is Ile  
Xaa<sub>39</sub> is Arg  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Pro  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Ser  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is His  
Xaa<sub>117</sub> is Asn  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Ser

Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Val  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is Tyr  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Ala  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Glu~~  
~~Xaa<sub>293</sub> is Gln~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Val  
Xaa<sub>325</sub> is Arg  
Xaa<sub>328</sub> is Gln  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Val  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg

Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Ser  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Gly  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Ser  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Asp.

**Claim 64.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe

Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Ser  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Val  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is Tyr  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Ala  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Glu~~  
~~Xaa<sub>293</sub> is Gln~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Val  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Gln  
Xaa<sub>334</sub> is Ala  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Gly  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Val

Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Gly  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Asp.

**Claim 65.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys

Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Asp  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Ile  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr



Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Leu  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 66.** (currently amended) The isolated nucleic acid of claim 1 where

Xaa<sub>10</sub> is Phe or Leu  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Arg  
Xaa<sub>122</sub> is Val

Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Leu  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr

Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Glu  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Ile  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 67.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser

Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Ala  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Thr  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Arg  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Thr  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val

Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Ser  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 68.** (currently amended) The isolated nucleic acid of Claim 1 where

~~Xaa<sub>10</sub> is Phe or Leu~~  
Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is Leu  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is His  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile  
Xaa<sub>112</sub> is Arg

Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Leu  
Xaa<sub>162</sub> is Val  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Gln  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Thr  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Ile  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Thr  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Ile  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala  
Xaa<sub>325</sub> is Lys

Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Leu  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Met, and  
Xaa<sub>485</sub> is Gly.

**Claim 69.** (currently amended) The isolated nucleic acid-of Claim 1 where

Xaa<sub>16</sub> is Leu  
Xaa<sub>23</sub> is Thr  
Xaa<sub>25</sub> is Lys  
Xaa<sub>39</sub> is Lys  
Xaa<sub>48</sub> is Leu  
Xaa<sub>60</sub> is Leu  
Xaa<sub>73</sub> is His  
Xaa<sub>74</sub> is Tyr  
Xaa<sub>95</sub> is Thr  
Xaa<sub>96</sub> is Asn  
Xaa<sub>102</sub> is Asn  
Xaa<sub>110</sub> is Ile

Xaa<sub>112</sub> is Arg  
Xaa<sub>117</sub> is Ser  
Xaa<sub>118</sub> is Ser  
Xaa<sub>121</sub> is Met  
Xaa<sub>122</sub> is Val  
Xaa<sub>124</sub> is Phe  
Xaa<sub>129</sub> is Lys  
Xaa<sub>147</sub> is Lys  
Xaa<sub>159</sub> is Phe  
Xaa<sub>162</sub> is Ala  
Xaa<sub>166</sub> is Gly  
Xaa<sub>170</sub> is Arg  
Xaa<sub>175</sub> is Leu  
Xaa<sub>183</sub> is Ala  
Xaa<sub>187</sub> is Ile  
Xaa<sub>191</sub> is Met  
Xaa<sub>209</sub> is Phe  
Xaa<sub>219</sub> is Trp  
Xaa<sub>223</sub> is His  
Xaa<sub>253</sub> is Glu  
Xaa<sub>259</sub> is Lys  
Xaa<sub>263</sub> is Val  
Xaa<sub>264</sub> is Val  
Xaa<sub>268</sub> is Val  
Xaa<sub>272</sub> is Phe  
Xaa<sub>285</sub> is Met  
~~Xaa<sub>292</sub> is Asp~~  
~~Xaa<sub>293</sub> is His~~  
Xaa<sub>294</sub> is Thr  
Xaa<sub>301</sub> is Phe  
Xaa<sub>306</sub> is Thr  
Xaa<sub>311</sub> is Val  
Xaa<sub>312</sub> is Ala



Xaa<sub>325</sub> is Lys  
Xaa<sub>328</sub> is Glu  
Xaa<sub>334</sub> is Val  
Xaa<sub>342</sub> is Arg  
Xaa<sub>377</sub> is Thr  
Xaa<sub>381</sub> is Glu  
Xaa<sub>385</sub> is Tyr  
Xaa<sub>387</sub> is Ile  
Xaa<sub>393</sub> is Ile  
Xaa<sub>394</sub> is Pro  
Xaa<sub>402</sub> is Arg  
Xaa<sub>404</sub> is Pro  
Xaa<sub>413</sub> is Phe  
Xaa<sub>422</sub> is Gly  
Xaa<sub>428</sub> is Arg  
Xaa<sub>429</sub> is Pro  
Xaa<sub>435</sub> is Gln  
Xaa<sub>447</sub> is Arg  
Xaa<sub>453</sub> is Asn  
Xaa<sub>459</sub> is Thr, and  
Xaa<sub>485</sub> is Gly.

**Claim 70. –72.** (not entered)

### **Amendments to the Sequence Listing**

The attached Sequence Listing amends the errors introduced in the Sequence Listing filed with the response dated February 5, 2005. The present Sequence Listing includes the following corrections: the Ile amino acid at position 294 of SEQ ID NO:66 has been replaced with Xaa and defined under Misc\_Feature in the <223> identifier as Xaa=Thr or Ile. In addition, Xaa at position 295 in SEQ ID NO:66 has been replaced with Lys. Support for the changes to the Sequence Listing are presented in the Remarks, set forth below, and are herein incorporated by reference.

This Sequence Listing will replace all prior versions, and Sequence Listings, in the Application:

Attachment: Replacement Sequence Listing